MATERIAL SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

National Institute of Standards and Technology
Standard Reference Materials Program
100 Bureau Drive, Stop 2320
Gaithersburg, Maryland 20899-2320

SRM Number: 951
MSDS Number: 951
SRM Name: Boric Acid Standard

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Description: This Standard Reference Material is certified for use as an isotopic reference material for the calibration of mass spectrometers. The material consists of highly purified boric acid of high homogeneity. A unit of SRM 951 consists of 10 g of powder.

Substance: Boric Acid.

Other Designations: Boric Acid (Orthoboric acid; boracic acid; boric trihydroxide; trihydroxyborene)

2. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Component	CAS Registry	EC Number (EINECS)	Mass Fraction (%)
Boric Acid	10043-35-3	233-139-2	100

Index, R/S Phrases (EC): Xi; R37, R38; S2, S24, S46
See "Section 15".

3. HAZARDS IDENTIFICATION

NFPA Ratings (Scale 0–4): Health = 2 Fire = 0 Reactivity = 0

Major Health Hazards: Respiratory tract irritation, skin irritation, central nervous system depression, kidney damage.

Physical Hazards: Not applicable.

Potential Health Effects (short term exposure)

Inhalation: Irritation to the mucous membranes and respiratory tract, nausea, vomiting, diarrhea, stomach pain, skin disorders, fever, changes in blood pressure, irregular heartbeat, headache, drowsiness, dizziness, disorientation, tremors, loss of coordination, visual disturbances, bluish skin color, internal bleeding, kidney damage, reproductive effects.

Skin Contact: Skin irritation, skin disorders, and effects similar to inhalation.

Eye Contact: May cause irritation.

Ingestion: Gastrointestinal irritation, and effects similar to inhalation.

Listed as a Carcinogen/Potential Carcinogen

	Yes	No
In the National Toxicology Program (NTP) Report on Carcinogens		X
In the International Agency for Research on Cancer (IARC) Monographs		X
By the Occupational Safety and Health Administration (OSHA)		X

4. First Aid Measures

Inhalation: If adverse effects occur, remove to uncontaminated area. Give artificial respiration, if not breathing, by qualified personnel. Get immediate medical attention.

Skin Contact: Rinse affected area with copious amounts of water for at least 15 minutes while removing contaminated clothing. Get medical attention, if needed.

Eye Contact: Immediately flush eyes, including under the eyelids, with copious amounts of water for at least 15 minutes. Get immediate medical attention.

Ingestion: If a large amount is swallowed, get immediate medical attention.

5. Fire Fighting Measures

Fire and Explosion Hazards: Negligible.

Extinguishing Media: Use extinguishing agents appropriate for the surrounding fire.

Fire Fighting: Move container from fire area if it can be done without risk. Avoid inhalation of material or combustion by-products. Wear full protective clothing and NIOSH-approved self-contained breathing apparatus (SCBA).

Flash Point (°C): Not applicable **Autoignition (°C):** Not applicable **Method:** Not applicable

Flammability Limits in Air (Volume %): **Upper:** Not applicable

Lower: Not Applicable

Flammability Class (OSHA): Not applicable

6. Accidental Release Measures

Occupational Release: Collect spilled material in appropriate container for proper disposal. Refer to Section 13 "Disposal Considerations".

7. Handling and Storage

Storage: Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances. Wear splash resistant safety goggles. Wear chemical resistant clothing and gloves. An eye wash station and washing facilities should be readily available near handling and use areas.

Safe Handling Precautions: See Section 8 "Exposure Controls and Personal Protection".

8. Exposure Controls and Personal Protection

Boric Acid: No occupational limits established.

Ventilation: Use local exhaust ventilation system.

Respirator: If necessary, refer to the "NIOSH Guide to the Selection and Use of Particulate Respirators Certified under 42 CFR 84" for selection and use of respirators with organic vapor cartridges certified by NIOSH.

Eye Protection: Wear safety goggles. **DO NOT** wear contact lenses in the laboratory. An eye wash station should be readily available near of handling and use areas.

Personal Protection: Wear protective clothing and chemically resistant gloves to prevent skin exposure.

9. PHYSICAL AND CHEMICAL PROPERTIES

Boric Acid
Appearance and Odor: odorless white powder
Molecular Formula: H_3BO_3
Relative Atomic Mass: 61.8
Density: 1.43 g/cm^3
Decomposition Point: 170 °C –180 °C
Melting Point: not available
Solubility in Water: 6.35% @ 30 °C
Solvent Solubility: soluble in hot alcohols and glycerol; moderately soluble in liquid ammonia; slightly soluble in acetone; very slightly soluble in ether

10. STABILITY AND REACTIVITY

Stability: X Stable _____ Unstable

Stable at normal temperatures and pressure.

Conditions to Avoid: Boric acid and acetic ahnhydride on heating produce an explosive reaction. Boric acid and iron may be corrosive in the presence of moisture. Boric acid and potassium may produce a violent or explosive reaction.

Incompatible Materials: Metals.

Fire/Explosion Information: See Section 5, "Fire Fighting Measures".

Hazardous Decomposition: Thermal decomposition or combustion may produce inorganic acids and anhydrides.

Hazardous Polymerization: _____ Will Occur X Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Entry: X Inhalation X Skin X Ingestion

Boric Acid

LD_{LO} (oral-woman): 200 mg/kg
TD_{LO} (oral-woman): 400 mg/kg,
LC_{LO} (inhalation-rat): 28 mg/m^3/4 hour(s)

Health Effects (Acute Exposure)

Inhalation of boric acid powder may cause irritation to the mucous membranes, sore throat, and coughing. Absorption through the mucous membranes may cause systemic poisoning as described in acute ingestion. Ingestion may cause nausea, epigastric pain, hemorrhagic gastritis, bloody vomit and diarrhea, weakness, lethargy, headache, restlessness, tremors and twitching of facial muscles and extremities, intermittent convulsions, and eventual central nervous system depression with confusion, drowsiness, and prostration. Skin contact may cause irritation.

Medical Conditions Generally Aggravated by Exposure: Gastrointestinal and respiratory disorders. Blood disorders, nervous system disorders.

12. ECOLOGICAL INFORMATION

Environmental Summary: LC_{50} (fish toxicity): 0.6 g/L/96 hour(s)

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose in accordance with all applicable federal, state, and local regulations

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: Exempt. Small entity laboratory preparation.

Canadian Transportation WHMIS: Not applicable.

15. REGULATORY INFORMATION

U.S. REGULATIONS

CERCLA Sections 102a/103 (40 CFR 302.4): Not applicable.

SARA Title III Section 302 (40 CFR 355.30): Not applicable.

SARA Title III Section 304 (40 CFR 355.40): Not applicable.

SARA Title III Section 313 (40 CFR 372.65): Not applicable.

OSHA Process Safety (29 CFR 1910.119): Not applicable.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21)

ACUTE:	Yes
CHRONIC:	Yes
FIRE:	No
REACTIVE:	No
SUDDEN RELEASE:	No

STATE REGULATIONS

California Proposition 65: Not regulated.

CANADIAN REGULATIONS

WHMIS Classification: Not determined.

EUROPEAN REGULATIONS

EC Classification

Xi Irritant.

EC Risk and Safety Phrases

R37	Irritating to respiratory system.
R38	Irritating to skin.
S2	Keep out of reach of children.
S24	Avoid contact with skin.
S46	If swallowed, seek medical advice immediately and show this container or label.

NATIONAL INVENTORY STATUS

U.S. Inventory (TSCA): Listed on inventory.

TSCA 12(b), Export Notification: Not listed.

16. OTHER INFORMATION

Sources: MDL Information Systems, Inc., MSDS *Boric Acid*, 16 September 2004.

Disclaimer: Physical and chemical data contained in this MSDS are provided only for use as a guide in assessing the hazardous nature of the material. The MSDS was prepared carefully, using current references; however, NIST does not certify the data in the MSDS. The certified values for this material are given in the NIST Certificate of Analysis.